



Taxonomical Notes on Eight new records of eudicots from the dry deciduous *Saal* forests of Birbhum district, West Bengal, India

Mandal Suman Kalyan✉

Department of Botany, Visva Bharati, Santiniketan-731235, India

✉ **Corresponding author**

Department of Botany, Visva Bharati, Santiniketan-731235,
India

Email: skmandal.vb@gmail.com

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General Note



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ABSTRACT

Forest areas in the district of Birbhum are dry deciduous type and floristically rich. In the occasion of ethnobotanical field survey 8 angiospermic taxa namely- *Citharexylum spinosum* L. (Verbenaceae), *Ehretia laevis* Roxb. (Boraginaceae), *Hymenodictyon orixense* (Roxb.) Mabb. (Rubiaceae), *Malachra capitata* (L.) L. (Malvaceae), *Manilkara hexandra* (Roxb.) Dubard (Sapotaceae), *Muntingia calabura* L. (Muntingiaceae), *Phyllanthus acidus* (L.) Skeels (Euphorbiaceae) and *Solanum diphyllum* L. (Solanaceae) have been collected from different forest areas for the first time in this district. Taxonomical notes along with correct and updated citation, flowering and fruiting time, site of collection and voucher specimen number were provided for future work.

Keywords: Eudicots, new addition, dry deciduous *Saal* forests

1. INTRODUCTION

Angiosperms are the most diverse group of land plant and still there is a confusion regarding the actual number of flowering plant present in the world. As many threatened plant taxa gradually disappeared from its natural habitat, many plant species have been invented almost each and every day throughout the various parts of the world and being included in the respective regional or state or district floras. In the world, the total member of flowering plant is estimated to be 352000 (Paton et al., 2008). There are many plant taxa still hidden under the natures' treasury which have not yet been documented. Exploring plant species is a very significant part of the taxonomy and for further scientific study.

Birbhum is the land of red laterite soil and one of the floristically rich districts of West Bengal. Perusal of literature regarding plant resources of this district reveals that many research articles have been published by various workers in the form of floristic account, ethnobotanical observation and palynological study (Guha, 1968; Mandal et al., 1998; Dutta and Mandal, 1998; Rahaman et al., 1999; Rahaman, 2011; Pradhan and Rahaman, 2014; Mandal et al., 2017). A number of works in the field of ethnobotany have been published from the district where a large number of economically as well as medicinally important plant species have been documented (Rahaman et al., 2007, 2008, 2009; Rahaman and Pradhan, 2011; Rahaman and Saha, 2011; Rahaman, 2012; Mondal and Rahaman, 2012; Das and Rahaman, 2014; Mandal and Rahaman, 2014). Through field survey and discussion of relevant literature from the district it has been observed that 8 angiospermic plant species have not yet been reported from the district (Basak, 1968; Guha, 1968; Mandal et al., 1987; Dutta and Mandal, 1998; Rahaman and Mandal, 1999; Rahaman et al., 1999, 2007, 2008, 2009; Choudhury et al., 2013). So, present study clearly indicates that those 8 species are the new addition to the district flora of Birbhum.

2. MATERIALS AND METHODS

The geographical coordinates of the district Birbhum is between 23°32'30" - 24°35'00" N latitudes and 87°5'25" - 88°1'40" E longitudes. The district stretches up to an area of 4545 sq km. Recorded forest area of this district covers 3.5% of the district's total land area. Forests of the district Birbhum are tropical dry deciduous type with a few representatives of the evergreen type. Some major forest areas are found in the district namely Ballavpur forest, Chaupahari forest, Charicha forest and Gonpur forest (Figure 1).

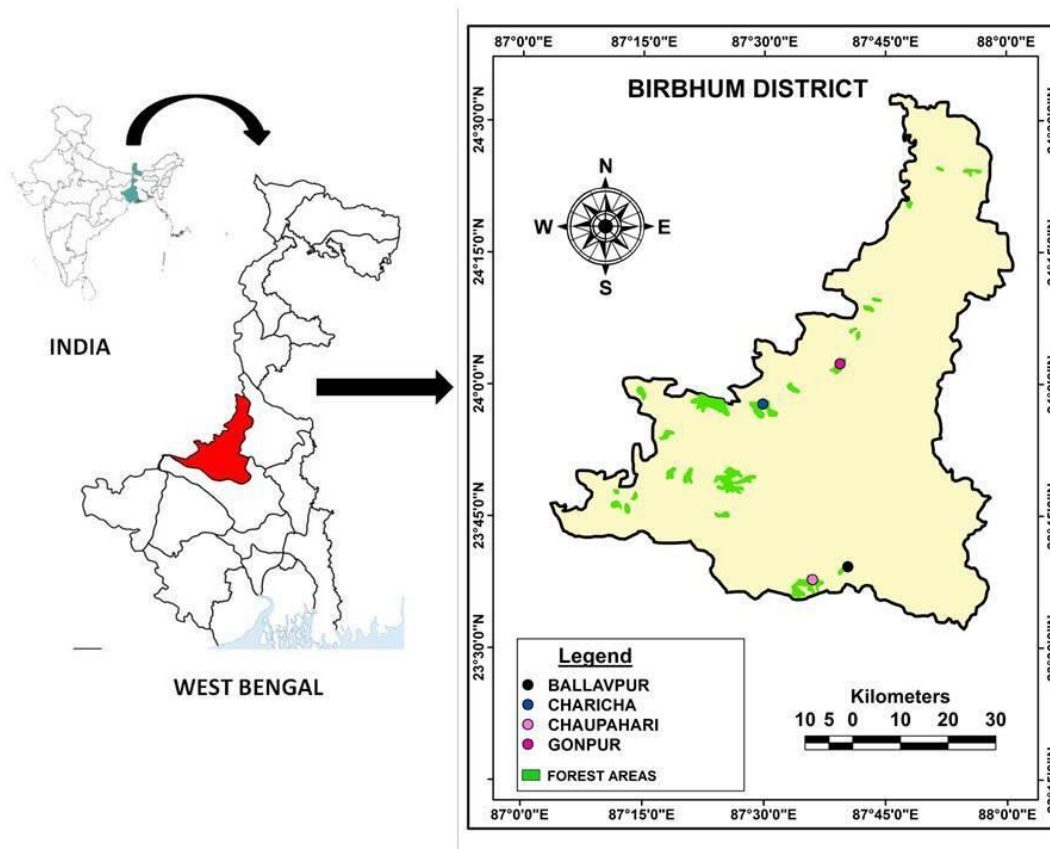


Figure 1 Study area map with the location of the forest areas from where the plant species were recorded

Many field visits were made in different areas of the district for the Ethnobotanical as well as floristic survey during 2011-2017. Collected specimens have carefully been identified by the reference of different floras (Sanyal, 1994; Saxena and Brahmam, 1994-1996) and confirmed the identification of the plants consulting the herbarium specimens housed at Central National Herbarium (CAL) Howrah, India. The collected plant specimens have been preserved as herbarium specimens following the standard method (Jain and Rao, 1977) and housed in the Visva-Bharati Herbarium, Department of Botany, Visva-Bharati, Santiniketan for future references.

The nomenclature of all the collected plant species have been updated following the standard websites like The Plant List and Tropicos.

3. RESULTS

Altogether 8 collected plant species have been found as new occurrence in the district Birbhum which belong to the angiospermic families of Verbenaceae, Boraginaceae, Rubiaceae, Malvaceae, Sapotaceae, Muntingiaceae, Euphorbiaceae and Solanaceae. A concise enumeration along with photographs of the collected species, flowering and fruiting time, localities in the district and field number of the plants have been provided here in this article (Figure 2).

***Citharexylum spinosum* L.**

Syn. *Citharexylum subserratum* Sw., Prodr. 91. 1788; Haines, Bot. Bihar Orissa 708. 1922 (Repr. Ed., 2: 743. 1961)

Family: Verbenaceae (Figure 2 A)

Botanical description

A small tree. Leaves opposite, petiolate, elliptic-lanceolate, glabrous; the leaf surface is generally papery or almost leathery in texture, dark green on both sides or slightly brighter or rusty on the underside, obtusely pointed or notched at the apex; entire; petiole 0.8-1.5 cm. Flowers small, white, fragrant, in long drooping racemes. Calyx truncate or shortly 5-lobbed. Corolla white, tubular-campanulate, obscurely bilabiate; lobes -5, unequal. Fruit type drupe, ovate, primarily yellow-orange, when mature turns black.

Specimen examined: Birbhum district, Ramnagar, Chaupahari, SK. Mandal 163

Flowering & fruiting: August - October

Site of collection: Chaupahari forest

***Ehretia laevis* Roxb.**

Ehretia laevis Roxb., Pl. Corom. 1: 42. T. 56. 1796; C.B. Clarke in Hook.f., Fl. Brit. India 4: 141. 1883; Haines, Bot. Bihar Orissa 576. 1922 (Repr. Ed., 2: 605. 1961). *E. laevis* var. *floribunda* (Benth.) Brandis, Forest Fl. N. W. India 340. 1874; C.B. Clarke in Hook.f., Fl. Brit. India 4: 142. 1883.

Family: Ehretiaceae (Boraginaceae) (Figure 2 B)

Botanical description

A small deciduous tree with spreading branches; up to 12 m. Bark light grey or whitish. Leaves are variable in size and shape; 5-7 × 9-13.5 cm; elliptic or ovate-elliptic, shortly acuminate, cuneate at base, entire or undulate, glabrous. Flowers small, numerous, subsessile, white, in terminal and axillary paniced cymes. Calyx hairy; 2 mm; densely tomentose outside; segments 5, ovate. Corolla lobes oblong, 5 mm, lobes 5, spreading. Stigma discoid. Style bi-fid. Fruits drupe, depressed and globose, become orange-red or black when mature.

Specimen examined: Birbhum district, Charicha, Charicha, SK. Mandal 261

Flowering & fruiting: Feb - May

Site of collection: Charicha forest

***Muntingia calabura* L.**

Muntingia calabura L., Sp. Pl. 509. 1753; S.K. Murti in B.D. Sharma & Sanjappa, Fl. India 3: 570. 1993.

Family: Muntingiaceae (Figure 2 C)

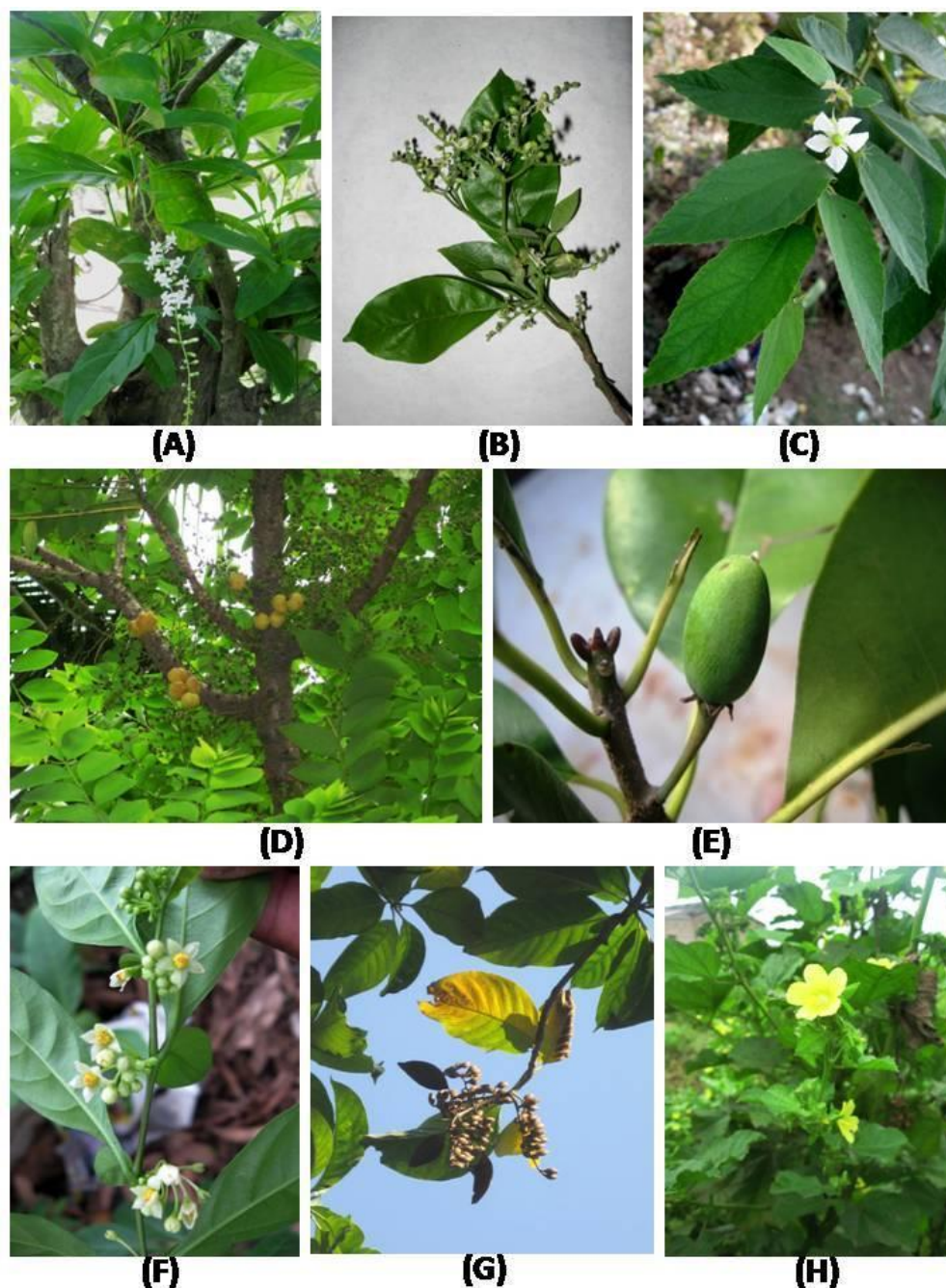


Figure 2 New additions to the forest flora of Birbhum district (A) *Citharexylum spinosum* L. (B) *Ehretia laevis* Roxb. (C) *Muntingia calabura* L. (D) *Phyllanthus acidus* (L.) Skeels (E) *Manilkara hexandra* (Roxb.) Dubard (F) *Solanum diphyllum* L. (G) *Hymenodictyon orixense* (Roxb.) Mabb. (H) *Malachra capitata* (L.) L.

Botanical description

A small tree up to 6 m., spreading branches nearly horizontal. Leaves oblong-lanceolate and pointed at the ends, 6-10 × 2-4 cm, petiole to 4 mm, dark-green on the upper surface, and somewhat hairy on the underside. Flowers white, in supra axillary fascicles. Fruits berry globose, red.

Specimen examined: Birbhum district, Ballavpur, Ballavpur, SK. Mandal 231

Flowering & fruiting: Feb - May

Site of collection: Ballavpur forest

***Phyllanthus acidus* (L.) Skeels**, U.S.D.A. Bur. Pl. Industr. Bull. 148:17. 1909; Webster, J. Arnold
Syn. *Cicca acida* (L.) Merr.

Phyllanthus acidus (L.) Skeels, U.S. Dept. Agric. Bur. Pl. Ind. Bull. 148: 17. 1909; Manilal & Sivar., Fl. Calicut 263. 1982; N.P.Balakr. & Chakrab., Fam. Euphorbiaceae India 369. 2007; Sunil & Sivadasan, Fl. Alappuzha Dist. 645. 2009; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 756. 2009. *Averrhoa acida* L., Sp. Pl. 428. 1753. *Phyllanthus distichus* (L.) Muell.-Arg. in DC., Prodr. 14:413. 1866; Hook. f., Fl. Brit. India 5: 304. 1887. *Cicca acida* (L.) Merr., Interpr. Rumph. Herb. Amboin. 314. 1917. *Cicca disticha* L., Mant. Pl. 1: 124. 1767; Gamble, Fl. Pres. Madras 1346(942). 1925.

Family: Euphorbiaceae (Figure 2 D)

Botanical description

Small or moderate sized tree; up to 10 m tall. Bark coarse, greyish, lenticels prominent. Branches bearing terminal clusters of leafy branchlets, 15 – 37.5 cm long, subtended by stipules at its base. Leaves 2.2-6.5 × 2.2-3 cm, at base of the branchlet shorter and orbicular, the upper larger, ovate-oblong or ovate-lanceolate, acute or obtuse, glabrous, somewhat pale glaucous beneath; petiole 2.5-5 mm in length; stipules tiny, awl-shaped. Flowers tetramerous, clustered usually in slender racemes from the tubercles; clusters with several males and 1-2 females; rarely 2-sexual. Male flowers red, minute. Tepals 4, imbricate in pairs. Stamens 4; filaments free. Female flowers green, larger. Tepals 4, two usually larger. Ovary shortly stipitate, 3-4 celled and lobed; styles 3-4, spreading, 2-fid. Drupe much depressed, globose, 1.5 – 1.8 cm diam, 3-4 angled and 6-8-grooved; greenish yellow to creamy-white; endocarp hard.

Specimen examined: Birbhum district, Ballavpur, Ballavpur, SK. Mandal 314

Flowering & fruiting: May - October

Site of collection: Ballavpur forest

Manilkara hexandra (Roxb.) Dubard

Mimusops hexandra Roxb., Pl. Corom. t. 15. 1795; Hook. f., Fl. Brit. India 3: 549. 1882; Gamble, Fl. Pres. Madras 766(538). 1921.

Mimusops indica A. DC. in DC., Prodr. 8: 205. 1844.

Family: Sapotaceae (Figure 2 E)

Botanical description

Evergreen tree, to 20 m high, with blackish gray and deeply furrowed bark; leaves elliptic, obovate or elliptic-oblong, apex obtuse or emarginated, Margin entire, glabrous, dark green, midrib more prominent beneath, petiole up to 2.5 cm long. Flowers small, bisexual, white, in axillary fascicles of 2–6, pedicelate, stout, calyx 6-lobed, corolla lobes 6. Stamens narrow, stamen 6-8, alternating with staminodes, bifid; staminodes shorter than stamen; anthers acute, twice as long as the filaments. Ovary hairy, superior, 12-chambered; style 4-5 mm long, subulate; stigma is simple. Berry type fruit, ellipsoidal oblong, brilliant yellow and single seeded. Seeds with stiff and lustrous brownish to blackish seed-coat.

Specimen examined: Birbhum district, Gonpur, Gonpur, SK. Mandal 347

Flowering & fruiting: November–June.

Site of collection: Gonpur forest

Solanum diphyllum L.

Solanum diphyllum L., Sp. Pl. 1: 184. 1753.

Family: Solanaceae (Figure 2 F)

Botanical description

Shrub, up to 3 m high, minutely pubescent throughout. Stem terete, green to brown. Two unequal leaves at each node, shape varies from elliptic to linear-obovate, sometimes decurrent into petiole, entire at margins, acute or obtuse at apex, 1–10 × 0.5–4 cm; petioles 3-5 mm long. Inflorescence- a racemose fascicle. Calyx cupular, minutely pubescent, 5-lobed; lobes broadly triangular, acute, hirsute. Corolla stellate, creamy white, 5-lobed; lobes equal, elliptic or linear-ovate, acute, incurved, hyaline. Stamens 5, equal, epipetalous, introrse; filaments short, flat; anthers oblong, basifixed, yellow. Fruit berries globose, glabrous, yellow or reddish yellow.

Specimen examined: Birbhum district, Usardihi, Chaupahari, SK. Mandal 371

Flowering & fruiting: May - Sept

Site of collection: Chaupahari forest

Hymenodictyon orixense (Roxb.) Mabb.

Syn. *Hymenodictyon excelsum* (Roxb.) Wall.

Hymenodictyon excelsum (Roxb.) Wall. in Roxb., Fl. Ind. 2: 149. 1824; Hook. f., Fl. Brit. India 3: 35. 1880

Family: Rubiaceae (Figure 2 G)

Botanical description

A large or medium-sized deciduous tree. Bark dark grey, mostly furrowed and rough. Leaves at the end of the branches, ovate-elliptic or broadly elliptic, acuminate, pubescent, base acute; petiolate. Stipules 5-6.5 mm. Flowers are stalked, whitish or yellowish green, fragrant, crowded on the terminal, drooping panicles, subtended by long-petioled leaf like bracts; bracts 2, persistent; bracteoles linear; calyx tube short, truncate to globose, lobes 5; corolla-tube is slender, five lobed; stamens 5 in number, adhere to the corolla limb; anthers nearly sagittate; ovary 2-chambered, inferior, many ovules in each chamber; style long, slender, stigma fusiform. Fruit capsule, oblong-elliptic, growing on recurved, thick pedicels.

Specimen examined: Birbhum district, Ramnagar, Chaupahari, SK. Mandal 311

Flowering & fruiting: Aug- Janu

Site of collection: Chaupahari forest

Malachra capitata (L.) L.

Malachra capitata (L.) L., Syst. Nat. (ed. 12) 2: 458. 1767; Hook. f., Fl. Brit. India 1: 329. 1874; T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3: 367. 1993

Family: Malvaceae (Figure 2 H)

Botanical description

Annual or perennial, erect hairy herbs or undershrubs. Leaves alternate, orbicular or ovate, cordate at base, crenate to serrate at margin, stellate and simple hairs on both surfaces. Inflorescences stout bearing 3-7 heads; each head with 2-5 flowers encircled by 3 or 4 leafy bracts; Calyx cupulate, accrescent; calyx lobes oblong, sometimes deltoid, acuminate, prominent 3-nerved, few stiff simple hairs at tip. Corolla bright yellow; petals obovate, ciliate at base, hairy outside, glabrous inside. Staminal column 1 cm long, pubescent. Ovary glabrous; style glabrous, branched; stigma hairy, capitate. Fruit schizocarp, pear shaped, 5-6 mm across; seeds trigonous, hairy, brownish black when mature.

Specimen examined: Birbhum district, Charicha, Charicha, SK. Mandal 387

Flowering & fruiting: April - December

Site of collection: Charicha forest

4. CONCLUSION

Acquisition of floristic knowledge of a particular area helps to understand its diversity and thus provide important knowledge regarding resource utilization, its management and protection. All the eight reported species are very much economically important and inclusion of these taxa will definitely enrich the district flora.

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Conflict of Interest:

The authors declare that there are no conflicts of interests.

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